DoD Architects' Competency Framework

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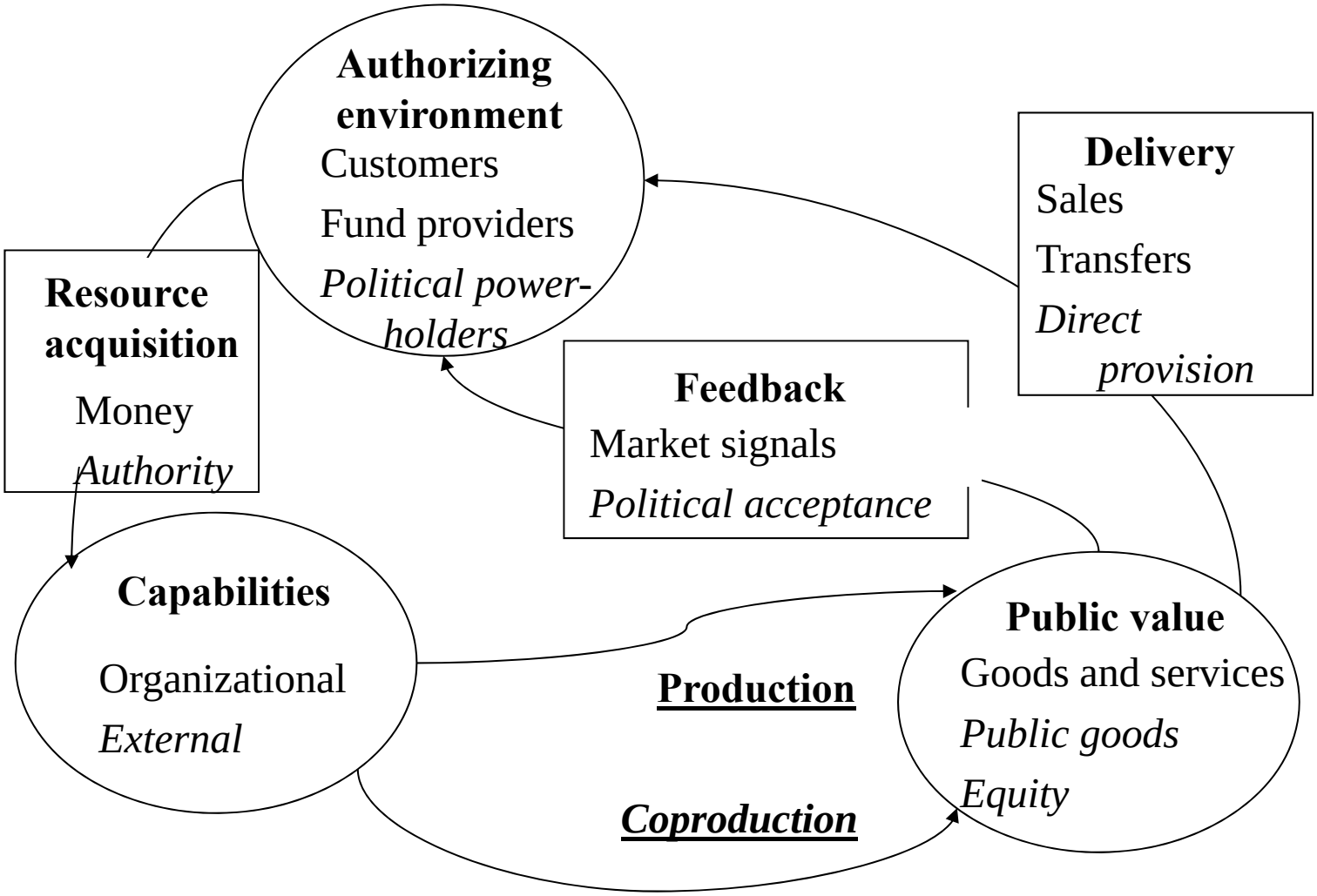
Agenda

- Public Value, Decision-making, and the Benefits of Enterprise Architecture
- Maturity of Enterprise Architecture in Knowledge Terms
- Steps to Increase Maturity of Enterprise Architecture
- DoD Architects' Competency Framework
- National Defense University iCollege EA Offerings

Public Value, Decision-making, and the Benefits of Enterprise Architecture

How Government Agencies Create Stakeholder Value



Source: Model of Co-production by John Alford from **IT Governance** by Weill and Ross

Agencies Choose Mixes of Strategies

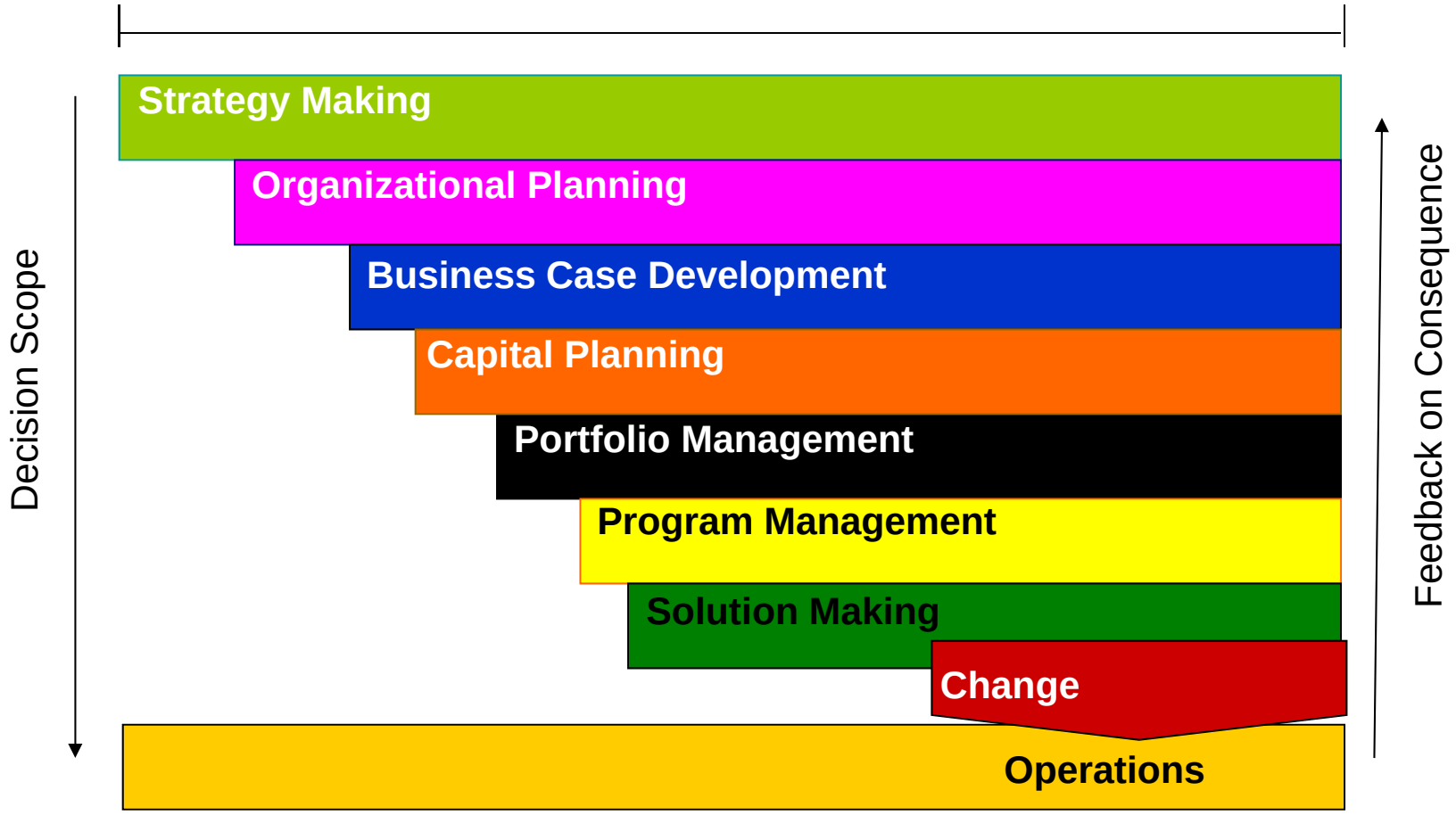
General Decision Strategy

- **Top-line Value Strategies**
  - Create New Offering
  - Change Existing Offering
  - Establish New Customer, Beneficiary, or Partner for Existing Offering
- **Bottom-line Value Strategies**
  - Reduce Cycle Time
  - Reduce Time to Market
  - Reduce Lifecycle Cost
    - Fewer Inputs
    - Less Costly Inputs
    - Less Waste

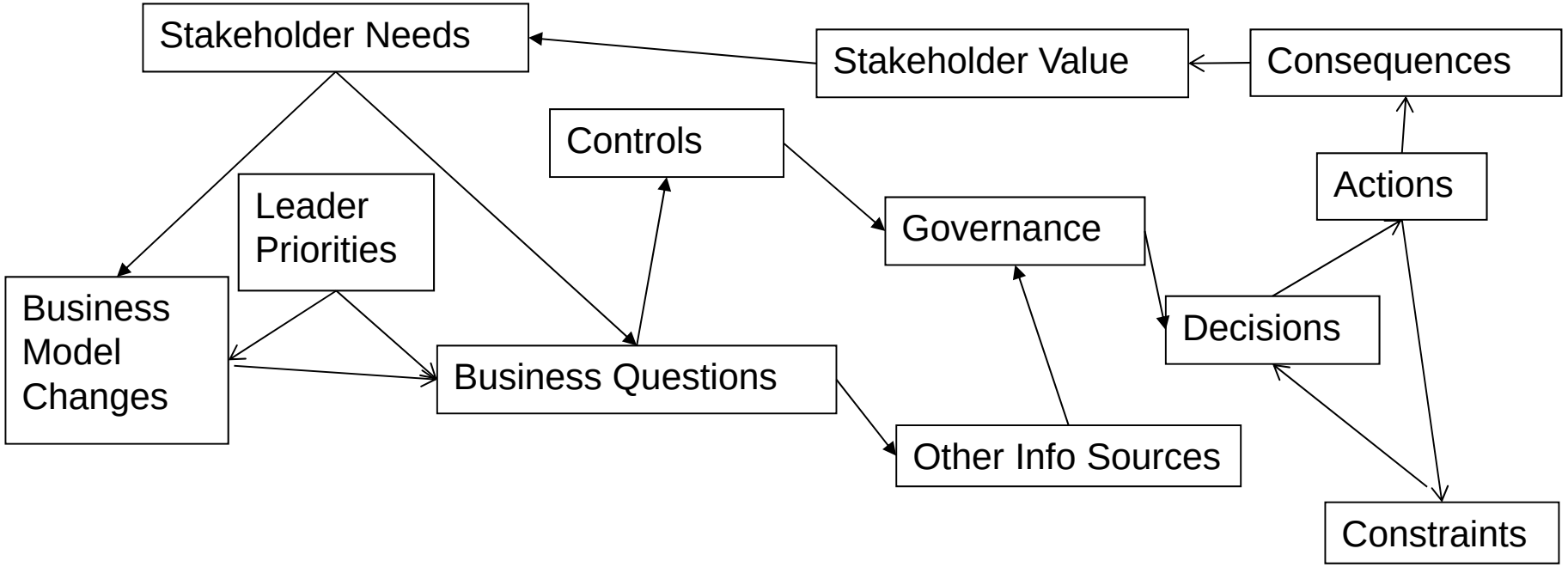
Increase Success Rate

Decrease Failure Rate

Decision Lifecycle



Public Value and Decision-Making



The problem is that there are too many strategic options for the agency resources available.

Decision-makers must choose which strategies should be allocated agency resources and lack information to do so.

Decision-makers Use Information from Many Different Sources

Information Domains	Sources	Examples
Strategic	Congress, President, Agency Head, Senior Leaders, Partners	Authorization, Appropriations, Directives, Stakeholder Feedback
Political & Competitive	Office of Management and Budget, Other Agencies, Partners, Other Stakeholders	Budget and Management Guidance, Stakeholder Feedback
Financial	Chief Financial Officer, Office of Management and Budget, Congress	Budget and Passback, Financial Reports, Financial Controls
Operational	Mission/Lines of Business, Staff Offices, Chief Financial Officer, Chief Information Officer	Business Plans, Program Charters, Business Processes, Information Packages, OPS Controls
Technical	CIO, CISO, Program Managers, IT Managers	Configurations, standards, IT assets, Tech Controls

Decision-makers Depend on Different Types of Information

- Facts
- Intentions
- Impressions
- Narratives
- Constraints

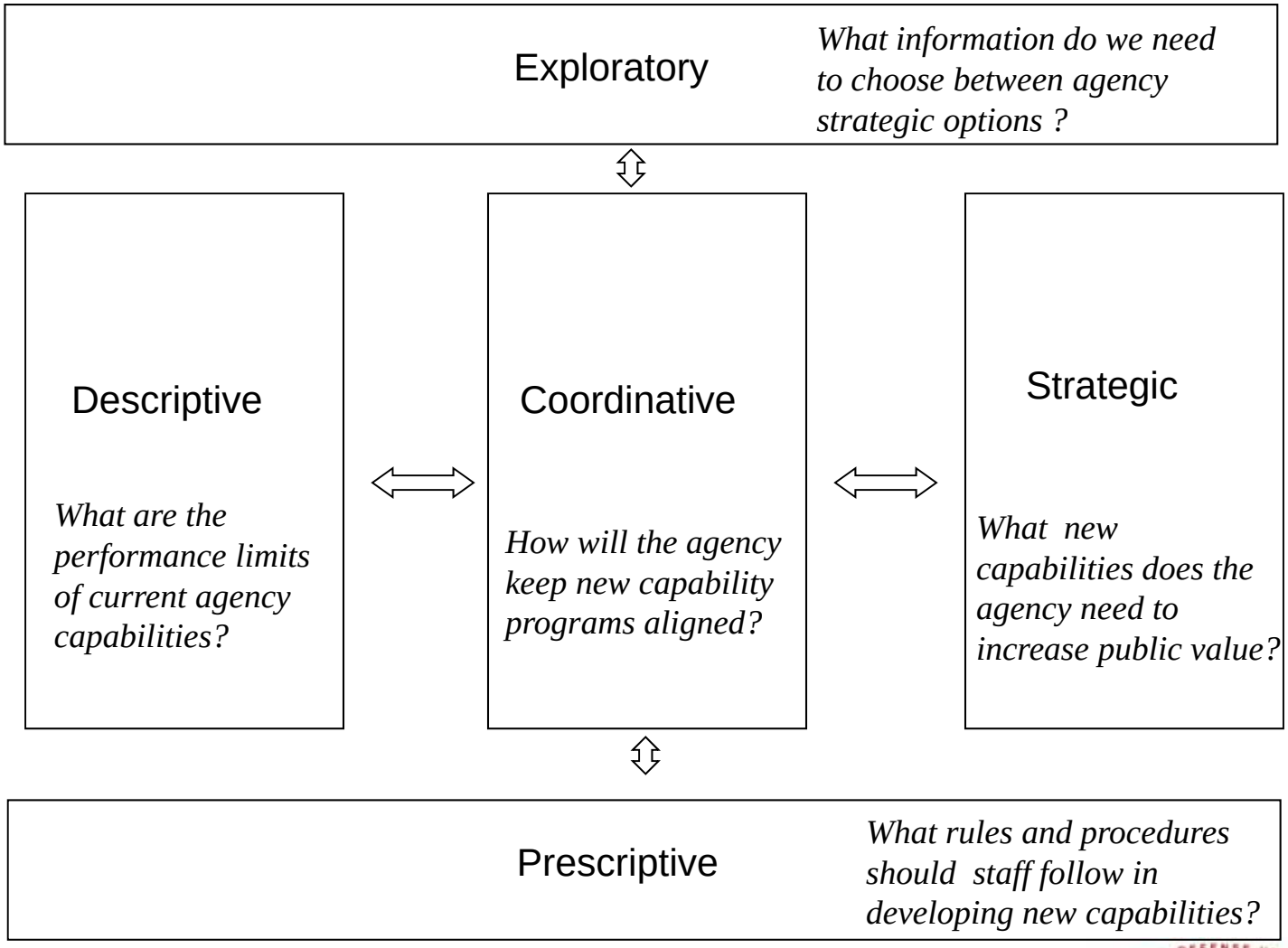
Constraints are Really Important to Decision-makers

- A decision option that violates a binding constraint is infeasible
- A decision option is much more likely to fail if it violates one or more non-binding constraints
- Earlier decisions impose constraints on current decision situations
- Agencies cannot go back and remake decisions – the time is past and the money is spent

Why Decision-Makers Need EA Now

- For US businesses, 50% of all capital expenditure goes to information and communications technology (ICTs)
- For knowledge-centered organizations like agencies, the percentage of capital expenditures for ICTs is even higher; up to 80% of effort is supported by ICTs
- As agency dependence on ICTs has increased over the past thirty years, constraints relating to ICTs have had ever greater impact on decision options
- EA captures operational and technical constraints, including information on ICTs, and integrates them with information from the strategic, political/competitive, and financial domains

EA Helps Answer Some Key Business Questions



EA Benefits

Type of Benefit	Decision Context	Examples
Lower information search cost	All	Constraints limiting decision options
Lower compliance cost	All except Strategy Making	Strategic goal alignment, accurate Exhibit 300
Lower non-compliance cost	Program Management, Solution Making	IT Standards Enforcement
Less unnecessary and/or redundant IT investment	Organizational Planning, Portfolio Management, Program Management, Solution Making	Lower integration and testing effort, Smaller project scope
Greater reuse of organizational capabilities, assets, resources, and effort	All	Shared services, enterprise infrastructure

Also Regulations and Guidance Require Many Agencies to Develop and Use EA

- Clinger-Cohen Act
- E-Government Act
- 2005 Defense Authorization Act
- 2010 Intelligence Authorization Act
- Office of Management and Budget Circulars A-11 and A-130

Maturity of Enterprise Architecture in Knowledge Terms

Fads, Good Ideas, Practices, Disciplines, Professions, and Paradigms

Example of Undertaking	Nature of Actor	Source of Knowledge	Duration of Use	Cause of Outcome
T-Groups	Huckster	Individual Experience	2-4 years	Discredited

Fads, Good Ideas, Practices, Disciplines, Professions, and Paradigms

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EA – Where Do You Think We Are Now?

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As Is EA - Good Idea?

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To Be EA – Discipline?

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What's the Transition Strategy for EA?

- **My sense is that EA has passed beyond being a management fad but has not achieved the status of a practice such as entrepreneurship studies**
- **I love doing EA, but I'm concerned about its longevity**
  - Absent standards
  - Aging practitioners
  - Stalling momentum
  - Funder fatigue
- **We need to codify the EA practice and train a new generation of practitioners**
- **We also need to fund and conduct EA research to inform education and training of architects**

Steps to Increase Maturity of Enterprise Architecture

- **According to Ross and Weill: "Top-performing enterprises had more than 20% higher profits than similar firms without governance and Enterprise Architecture."**
- **However, there are high barriers to EA becoming a trusted part of management**
  - Difficulty in measuring contribution of EA, much less ROI
  - Process not repeatable, partly due to multiple frameworks, methodologies, and tools
  - Absence of standards for evaluating the quality of an EA or an EA practitioner

Hallmarks of Enduring Practices and Professions

- Valuable, consistent, repeatable offerings
- Established standards, frameworks, models, and competencies
- Certification of education and training programs and providers
- Certification of practitioners at different levels of proficiency
- Liability for incompetent practice
- Formal licensure

Steps to Increase the Maturity of EA

- **Identity: new ideas about ourselves and what we do**
- **Value Proposition: new applications of EA practices**
- **Research: deeper understanding of our discipline**
- **Frameworks, Methodologies, and Tools: better support for new identities, value propositions, roles, and knowledge**
- **Practitioner Development: investments in ourselves and our successors**

- **In my opinion most enterprise architects have defined their identities in terms of**
  - Complying to an alphabet soup of guidance
  - Inventorying IT stuff – applications, infrastructure, standards
- **Our experience has lead us to some assumptions we need to question**
  - Business and IT strategy is someone else's problem
  - Don't get distracted with solutions,
  - There's no opportunity in IT operations management
- **If we look around, we can see opportunities to add value**

Practitioner Development

- **Education, Training, and Career Development for**
  - Current practitioners
  - Future practitioners
- **Common competencies**
- **Standardized career paths and position descriptions**
- **Certification by international standards authorities of**
  - Education and training programs
  - Practitioner competencies

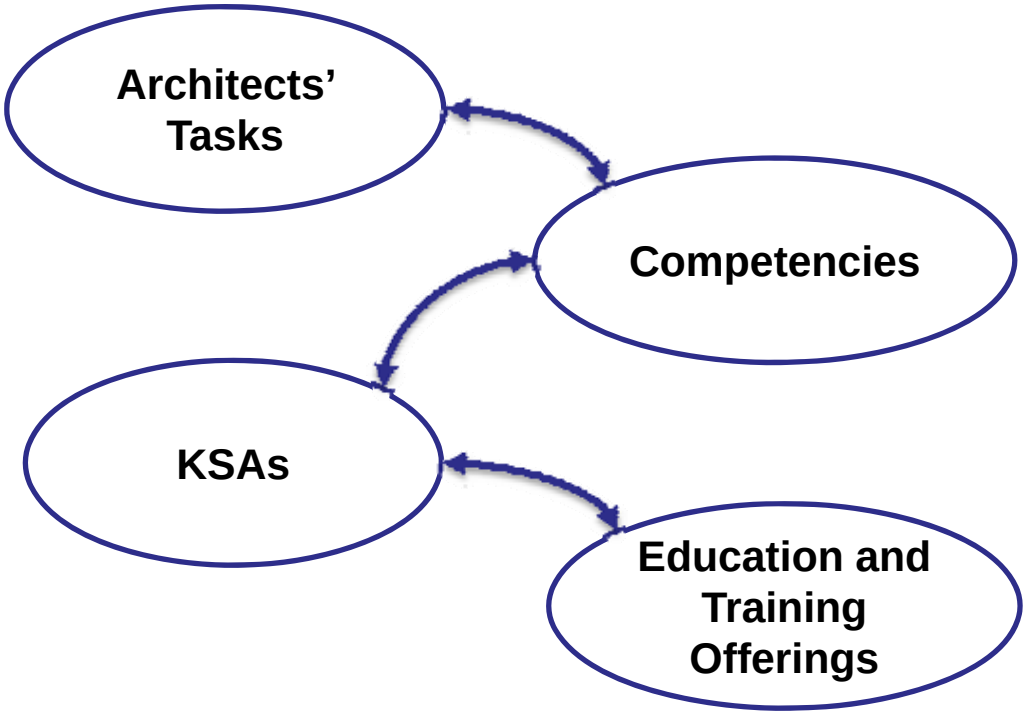
DoD Architects' Competency Framework

Background

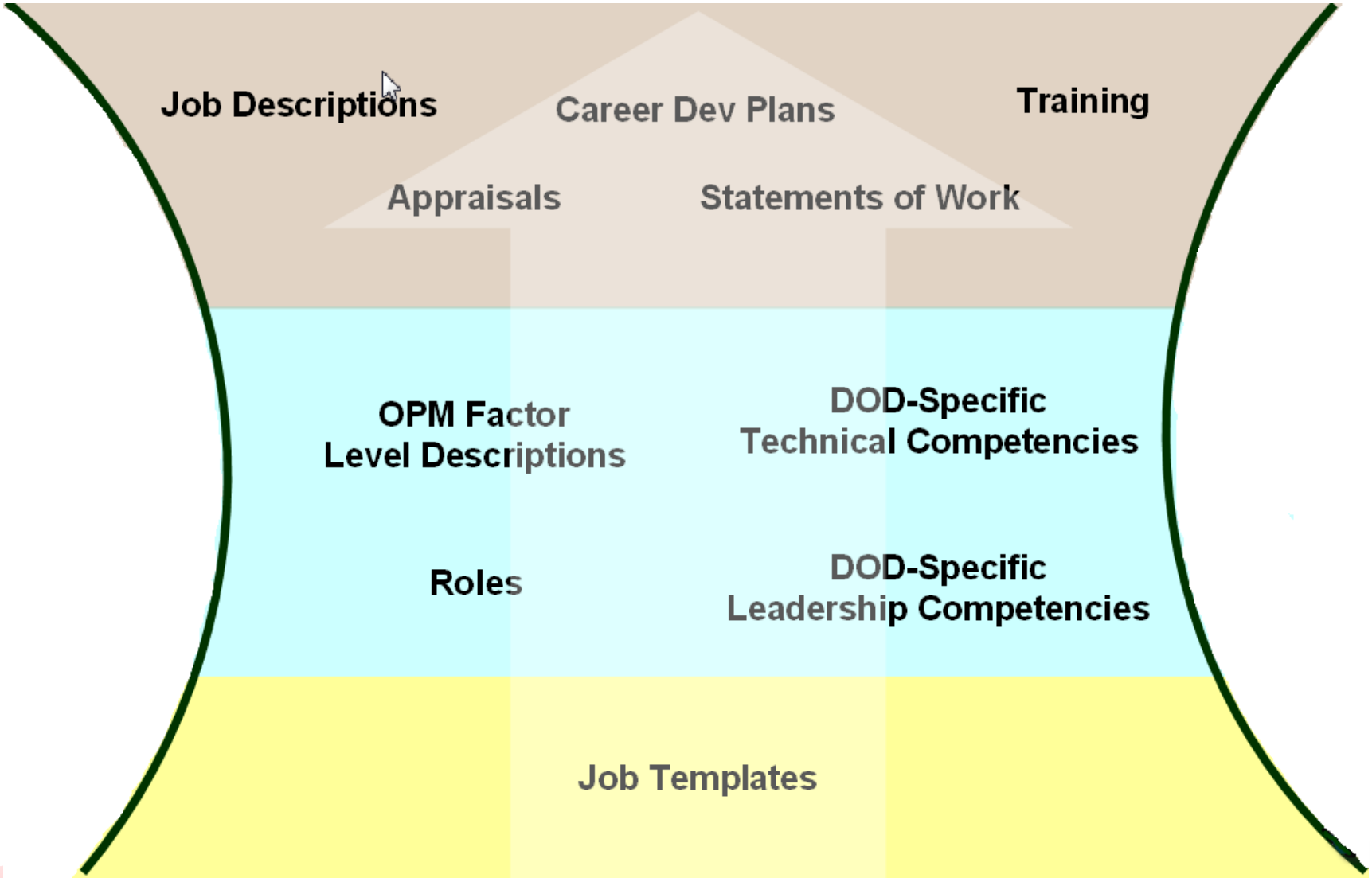
- **Over the past 5 years 4 working groups with members from DoD, industry, and academia have defined competencies for systems/enterprise architects**
- **Common Goals across Working Groups**
  - Complete DoD competency standards development
  - Leverage framework for civilian agency use
  - Broadly promote and evolve the framework standards with industry
- **The DoD Architects' Competency Framework will be implemented this year through the Defense Competency Assessment Tool (DCAT) for career planning and workforce development**
- **The DoD Architects' Competency Framework Guide is available now**

DoD Architects' Competency Framework Approach

- Identify architect tasks and required competencies
- Define competencies in terms of knowledge, skills, and abilities (KSAs)
- Test and refine the mappings with the help of EA practitioners and the academic community
- Link education and training offerings to KSAs



DOD Architects' Competency Framework Overview



Stakeholder Roles

- **Employee –** someone who is performing or considering an EA job
- **Supervisor –** someone who supervises an EA practitioner
- **Hiring Manager/HR Specialist** – someone responsible for filling a position for an EA job
- **Program Manager –** someone writing a statement of work for an acquisition that includes EA activities
- **Education/Training Provider –** someone who creates and delivers offerings to help an employee acquire KSAs that support his or her professional objectives

Framework Uses and Benefits

- **Career planning –** reduces time and effort for employee by organizing information about EA-related activities, jobs, job families, training, and experience
- **Appraisal –** reduces time and effort for supervisor and employee by clarifying expectations
- **Hiring –** reduces time and effort for hiring manager and HR specialist in specifying KSAs for new job descriptions
- **Contracting –** reduces time and effort for program manager in specifying EA activities and KSAs for new acquisitions
- **Educating and training –** reduces time and effort to develop a instructional program for architects

DoD Architects' Competencies (11 of 86, Technical)

Acquisition Process: Knowledge of DoD lifecycle acquisition program milestones, policies, procedures, and processes (e.g., Analysis of Alternatives (AoA), Capabilities Based Assessment (CBA)).	√		√
Architecture Frameworks: Knowledge of the current Department of Defense Architecture Framework (DoDAF) and other architecture frameworks to include an understanding of the foundational framework for developing and representing architecture descriptions that ensure a common denominator for understanding, comparing, and integrating architectures across organizational, Joint, and multinational boundaries.	√		√
Capacity Management: Knowledge of the principles and methods for monitoring, estimating, or reporting performance and capability of information systems/components.			
Capital Planning and Investment Control: Knowledge of the principles and methods of capital investment analysis or business case analysis, including return on investment analysis and portfolio management.			
Configuration Management: Knowledge of the principles and methods for planning or managing the implementation, update, or integration of systems components.	√		√
Contracting/ Procurement: Knowledge of various types of contracts, techniques or requirements (e.g., firm fixed price, cost plus award fee, Federal Acquisitions Regulations).			
Cost Benefit Analysis: Knowledge of the principles and methods of cost benefit analysis, including the time, value of money, present value concepts, and quantifying tangible and intangible benefits.			
Current Infrastructure: Knowledge of current Global Information Grid (GIG) and organizational infrastructure elements and how they impact implementation plans.	√		√
Data Management: Knowledge of the principles, procedures, and tools of data management, such as modeling techniques, data backup, data recovery, data dictionaries, data warehousing, data mining, data disposal, and data standardization processes.	√		√
Database Management Systems: Knowledge of the uses of database management systems and software to control the organization, storage, retrieval, security, and integrity of data.			
Enterprise Architecture: Knowledge of principles, concepts, and methods of enterprise architecture to align strategy, plans, and systems with the mission, goals, structure, and processes of the organization.	√	√	√

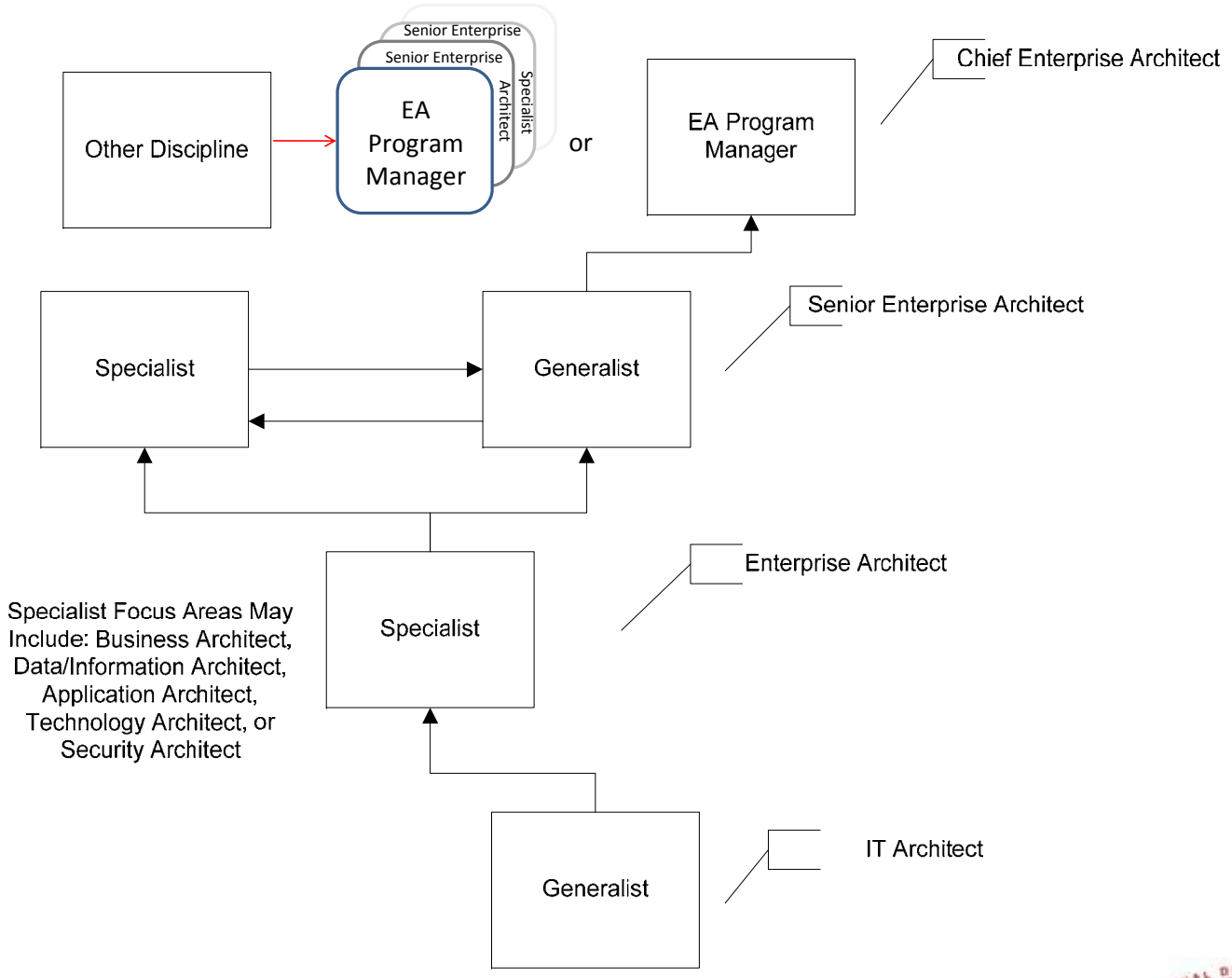
DoD Architects' Tasks (10 of 141)

#	Task	Critical Tasks
1	Attends or participates in formal training, workshops, or seminars (e.g., classroom, on-line, or computer-based).	√
2	Searches for and extracts information (e.g., from data repositories, file servers, Internet, reports, publications).	√
3	Uses information systems to access, create, edit, print, send, retrieve, or manipulate data, files, or other information.	√
4	Conducts training sessions, classes, workshops, or seminars to develop or maintain technical proficiency.	
5	Supports policy dissemination across the organization.	√
6	Designs training courses or develops instructional materials or activities.	
7	Reviews work products of others to provide feedback.	√
8	Participates in recruitment activities for prospective employees (e.g., job fairs, college/university sponsored events, professional associations).	
9	Recommends recognition and rewards for effective or outstanding performance.	
10	Schedules work assignments to coordinate the work of team.	√

Next Steps

➢ Develop and publish guide to DoD Architects' Framework	April 30, 2012
➢ Load DoD Architects' Framework Competencies and Tasks in DCAT	Q4FY12
➢ Develop Proficiency Level Illustrations for Architects in DCAT	Q4FY12
➢ Work with Scott Bernard of OMB to get feedback from the chief architects of other federal agencies	Q1FY13

Proficiency Level Illustrations Will Help Define EA Career Paths



Looking Beyond DoD

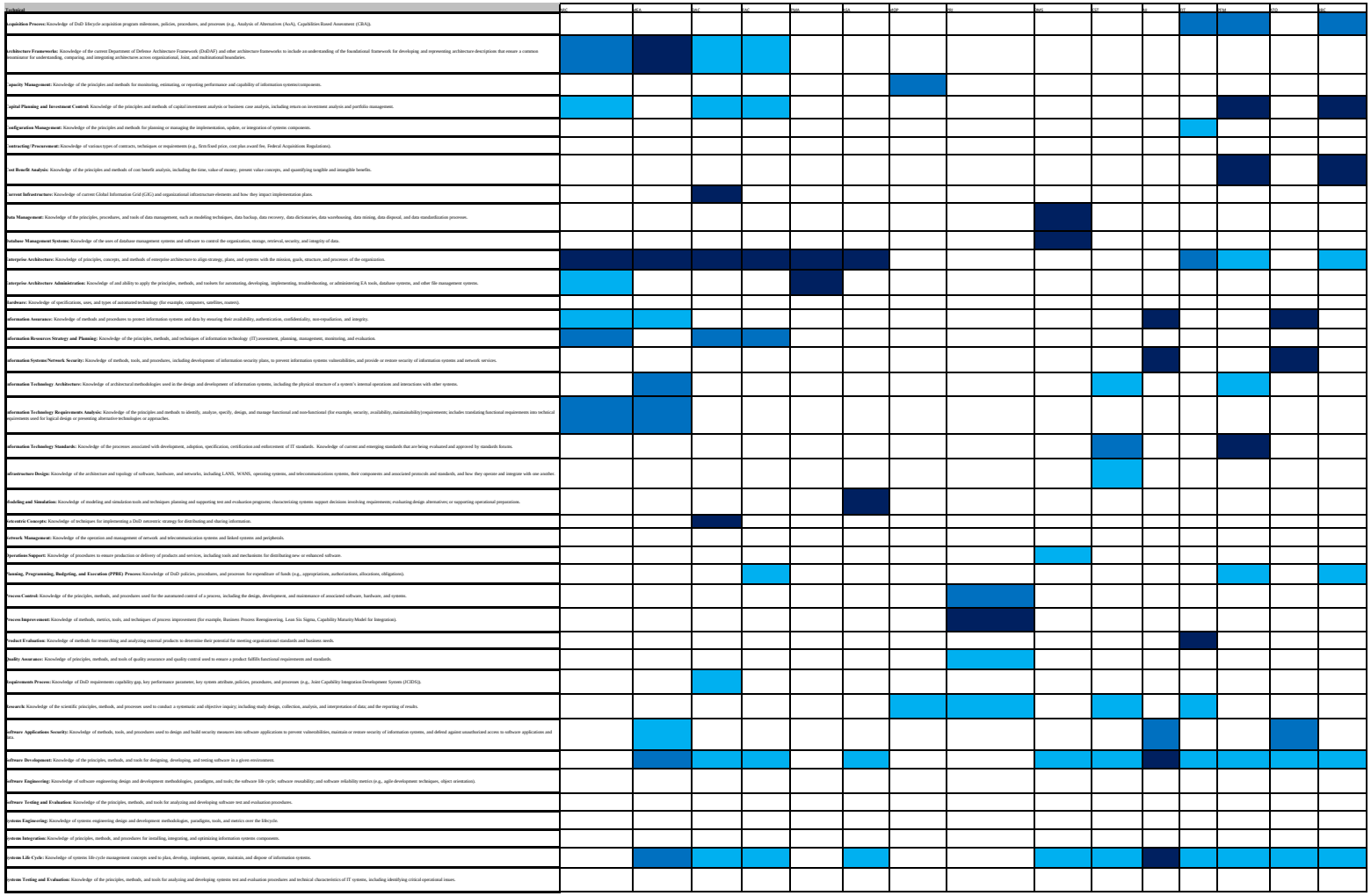
- **Engaging civilian agencies**
  - Department of Homeland Security
  - Department of Health and Human Services
  - Department of Interior
- **Connecting with the broader practitioner community**
  - Collaboration with OMB and the Chief Architect's Forum
  - Continued EA SIG engagement
  - Federation of EA Professional Organizations (FEAPO)
- **Supporting and stimulating research**
  - Penn State

National Defense University iCollege
EA Offerings

NDU iCollege Offerings

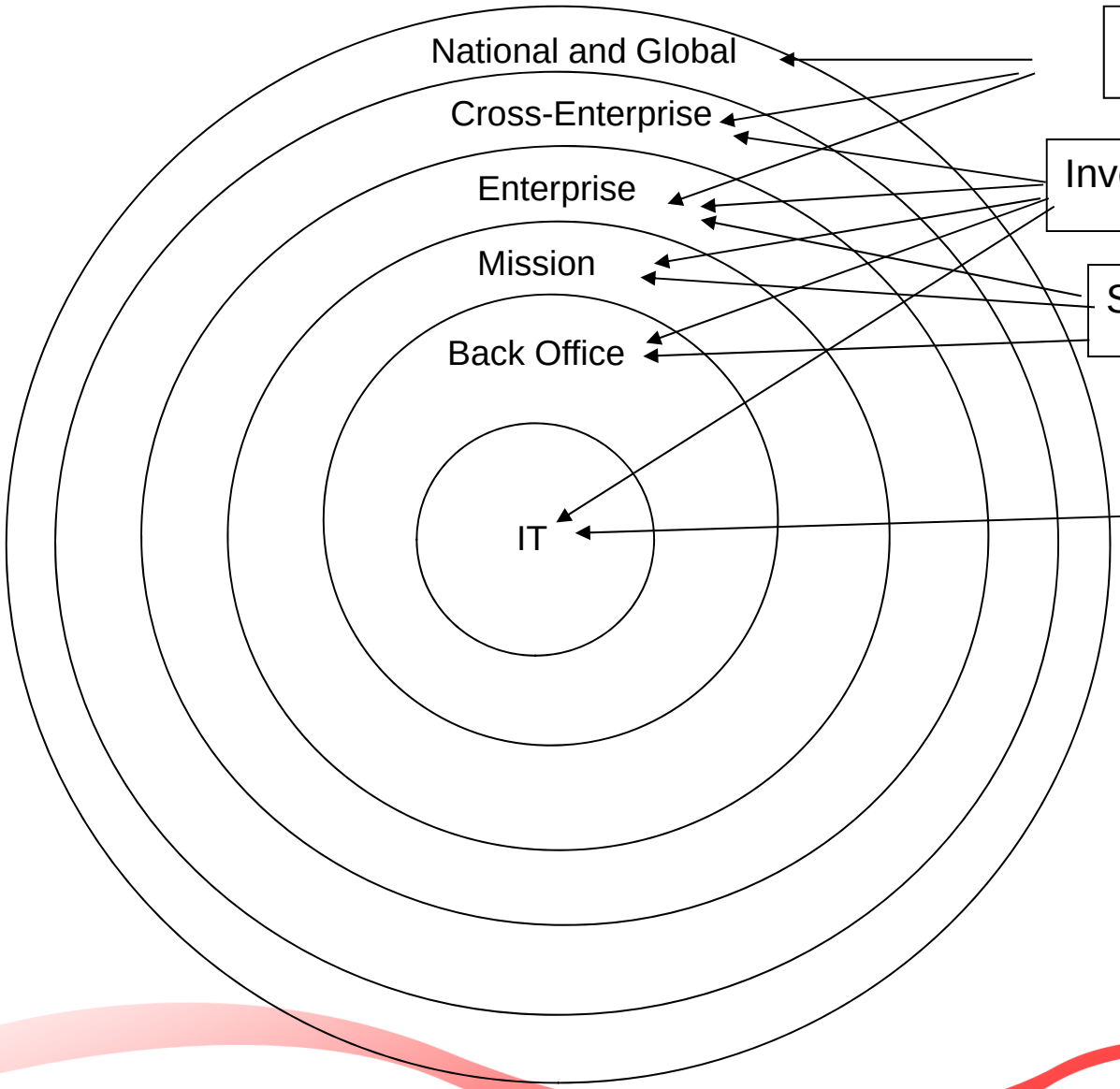
- **The NDU iCollege offers several programs to help architecture practitioners develop their management and leadership competencies**
  - Individual courses for professional development or graduate credit
  - A 3-level EA Certificate program
  - Master's of Science in Government Information Strategic Leader with concentration in EA
- **Our students come from across DoD and the federal government and include military officers and civil as well as international students and contractors**
- **Courses are available in a five-day classroom format or a twelve-week distance learning format. Average class size is 16 students**
- **There is no incremental cost for a DoD employee, but travel costs must be covered by the employee's component**

Preliminary Mapping of iCollege Courses to Technical Competencies



Backup

Opportunities for EA



White-space EA

Investment Context EA

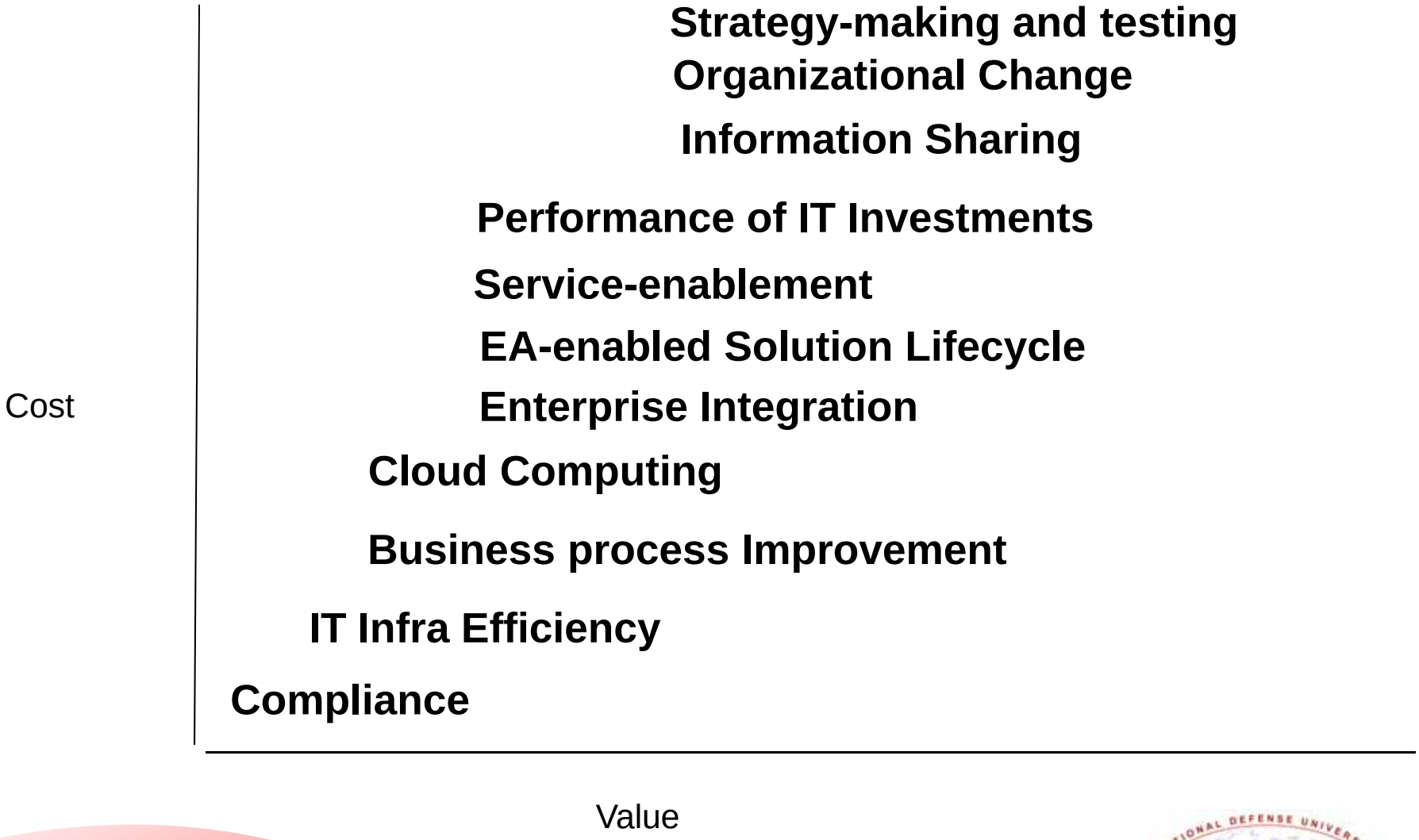
Solution-focused EA

IT Operations Management EA

EA Value Propositions

- **White-space EA**
  - Strategy-making and testing (Executive participation)
  - Organizational Change (Clarity of message rated by employees)
  - External Information Sharing and Collaboration (Cost of integration)
- **Investment Context EA**
  - Compliance with CPIC and EA Guidance (IT Investment Dashboard)
  - Performance of IT Investments (Portfolio ROI)
- **Solution-focused EA**
  - EA-enabled Solution Lifecycle (Time to quality)
  - Business process Improvement (Process cost)
  - Service-enablement of information systems (Reuse)
- **IT Operations Management EA**
  - Cost and efficiency of IT infrastructure (TCO)
  - Migration to Cloud Computing Platform (Accessibility of service)
  - Enterprise Software Suite Integration (% Effort for integration and testing)

Cost/Value of EA Value Propositions



Research

- **Engagement with scholars**
  - Describe and refine EA substance and syntax
  - Identify knowledge and skills to be taught
  - Establish and follow certification standards
  - Develop and deliver courses
  - Conduct and publish research for practitioners
- **Exciting Research Topics**
  - Real-time information for decision-making
  - What does a “good” EA look like?
  - Useful new ways of describing industry and business models
  - Federated governance of real-time, mission-critical process

Frameworks, Methodologies, and Tools

- Frameworks for integrating with other management disciplines
- Ways of describing sector, industry, and agency business models
- Quick turnaround and lightweight EA methods
- Creation, presentation, and management of dynamic information
- Crowd sourcing with Wiki-based EA updating
- More accessible and inexpensive modeling and simulation tools

References

- Association to Advance Collegiate Schools of Business. Report of the AACSB International Impact of Research Task Force. 2007.
- Carey, Dennis. A Discipline Development Model for Peace Studies. Peace & Change. Winter 80, Volume 6, Issue 1.
- Hardaway, Don, Mathieu, Richard G., and Will, Richard. A New Mission for the Information Systems Discipline. Computer. May 2008.
- Henze, Brent R. Emergent Genres in Young Disciplines: The Case of Ethnological Science. Technical Communication Quarterly. Volume 14, Issue 4. Autumn 2004.
- Hunter, Patti Wilger. An Unofficial Community: American Mathematical Statisticians before 1935. Annals of Science, Volume 56, 1999.
- Ross, Jeanne and Weill, Peter. IT Governance. 2005

Engagement between scholars and practitioners

- Define the “substantive structure” – conceptual linkages and research topics
- Define the “syntactic structure” – validate the substantive structure through research methodology
- Identify knowledge and skills to be taught
- Establish certification standards
- Develop curricula
- Obtain funding for research
- Publish in refereed journals

Exciting Research Topics

- Real-time information for decision-making
- Development of an organization-specific taxonomy/ontology for sense-making
- What does a “good” EA look like?
- Underlying cognitive processes essential to EA practices
- Useful new ways of describing industry and business models
- Federated governance of real-time, mission-critical process